6177956

08/735,705

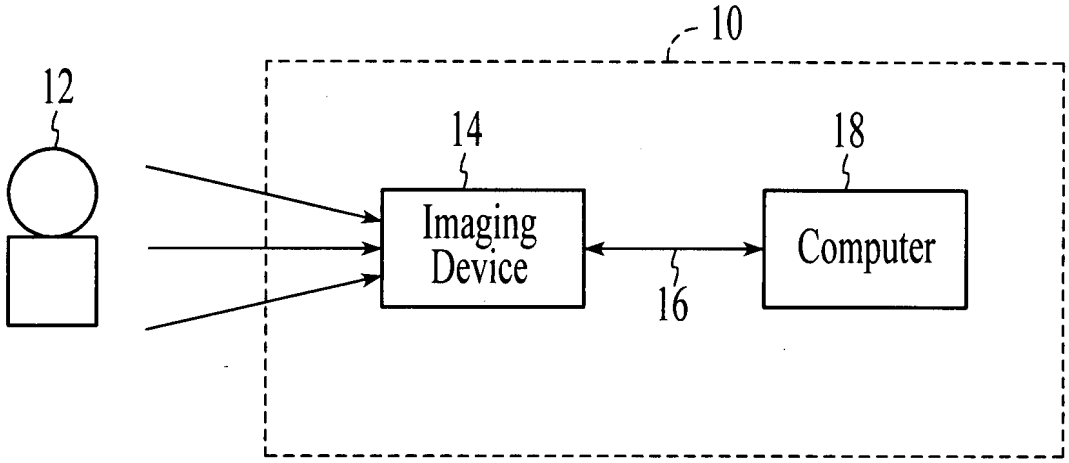


FIG. 1

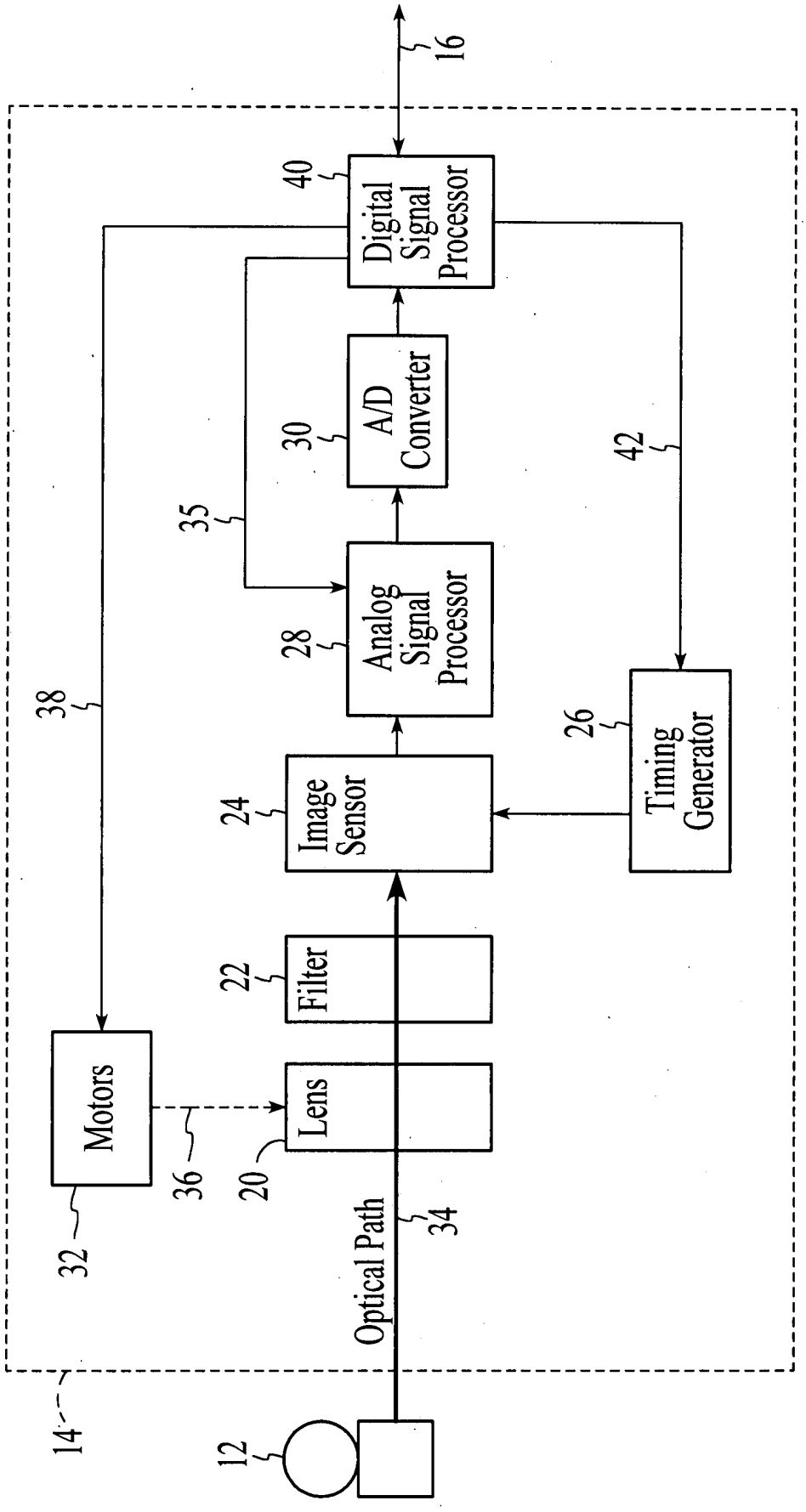
16
40
Digital Signal Processor
30
A/D Converter
35
42
28
Analog Signal Processor
38
26
Timing Generator
24
Image Sensor
22
Filter
Motors
Lens
36
20
32
34
Optical Path
14
12

FIG. 2

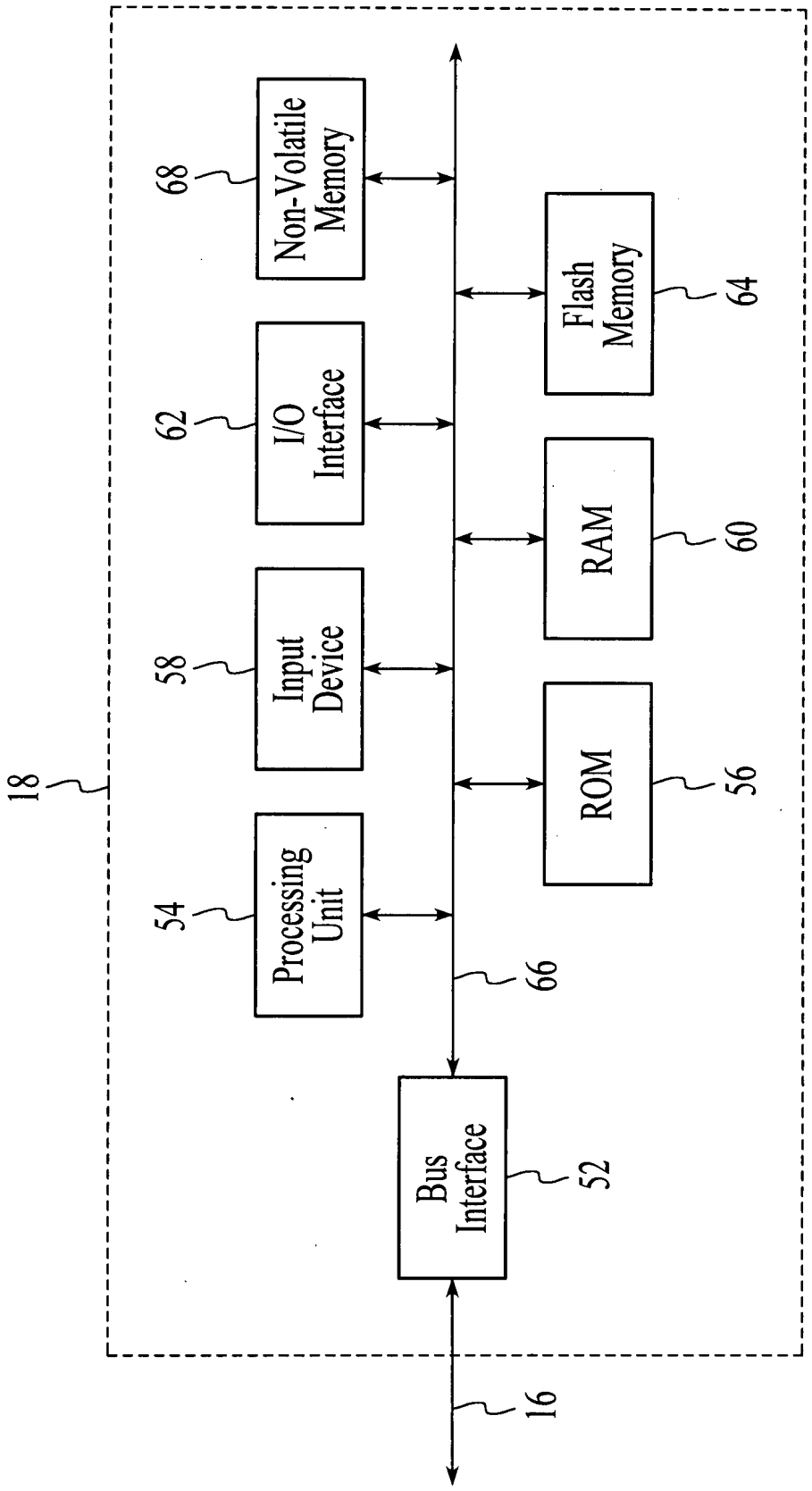
18
Processing Unit
54
Input Device
58
I/O Interface
62
Non-Volatile Memory
68
ROM
56
RAM
60
Flash Memory
64
66
Bus Interface
52
16

FIG. 3

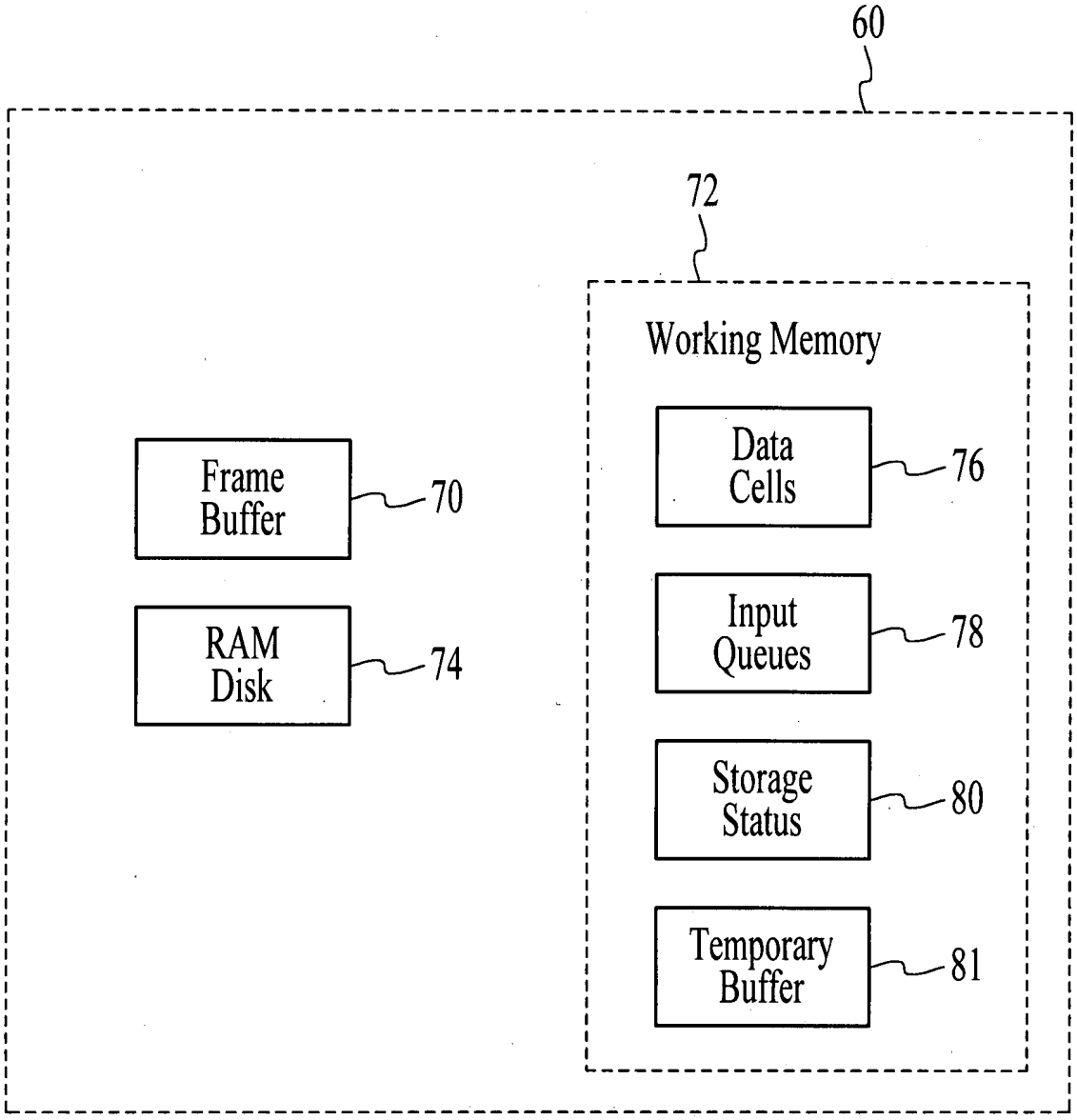
60
72
Working Memory
Frame Buffer
70
RAM Disk
74
Data Cells
76
Input Queues
78
Storage Status
80
Temporary Buffer
81

FIG. 4

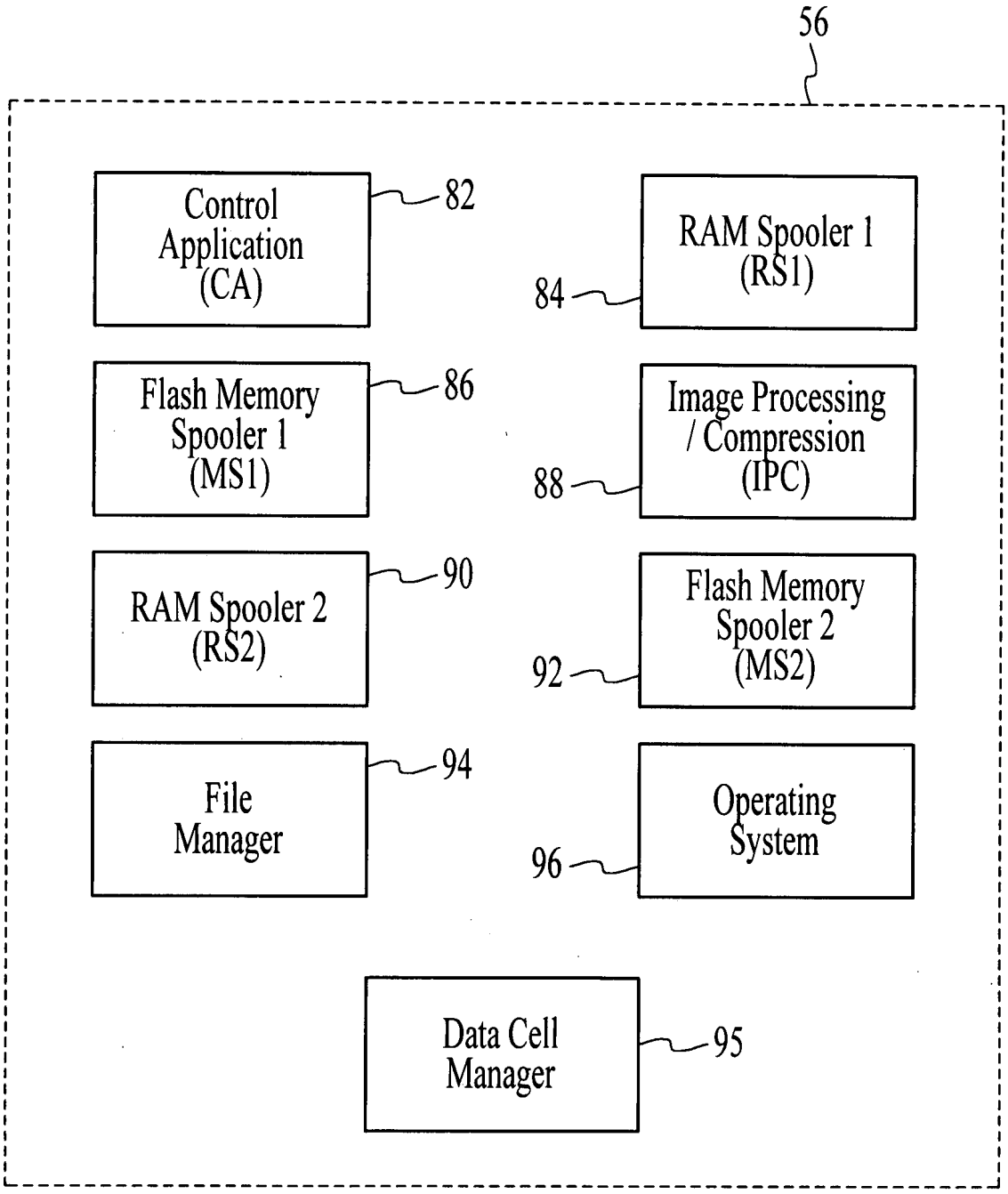
56
Control Application (CA)
82
RAM Spooler 1 (RS1)
84
Flash Memory Spooler 1 (MS1)
86
Image Processing / Compression (IPC)
88
RAM Spooler 2 (RS2)
90
Flash Memory Spooler 2 (MS2)
92
File Manager
94
Operating System
96
Data Cell Manager
95

FIG. 5

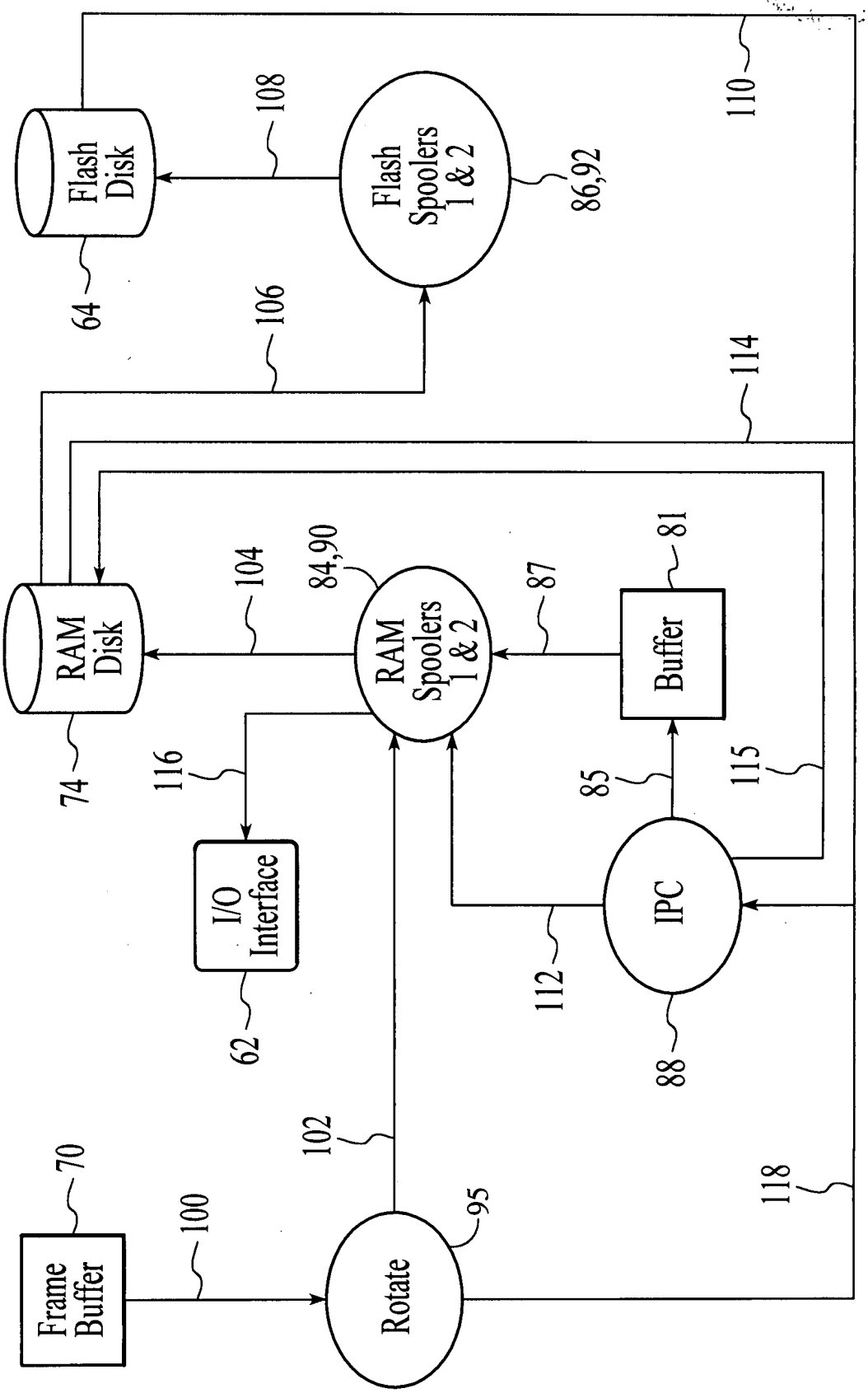
Flash Disk
64
108
Flash Spoolers 1 & 2
86,92
110
106
114
RAM Disk
74
104
84,90
RAM Spoolers 1 & 2
87
Buffer
81
116
I/O Interface
62
85
115
IPC
112
88
Frame Buffer
70
100
102
Rotate
95
118

FIG. 6

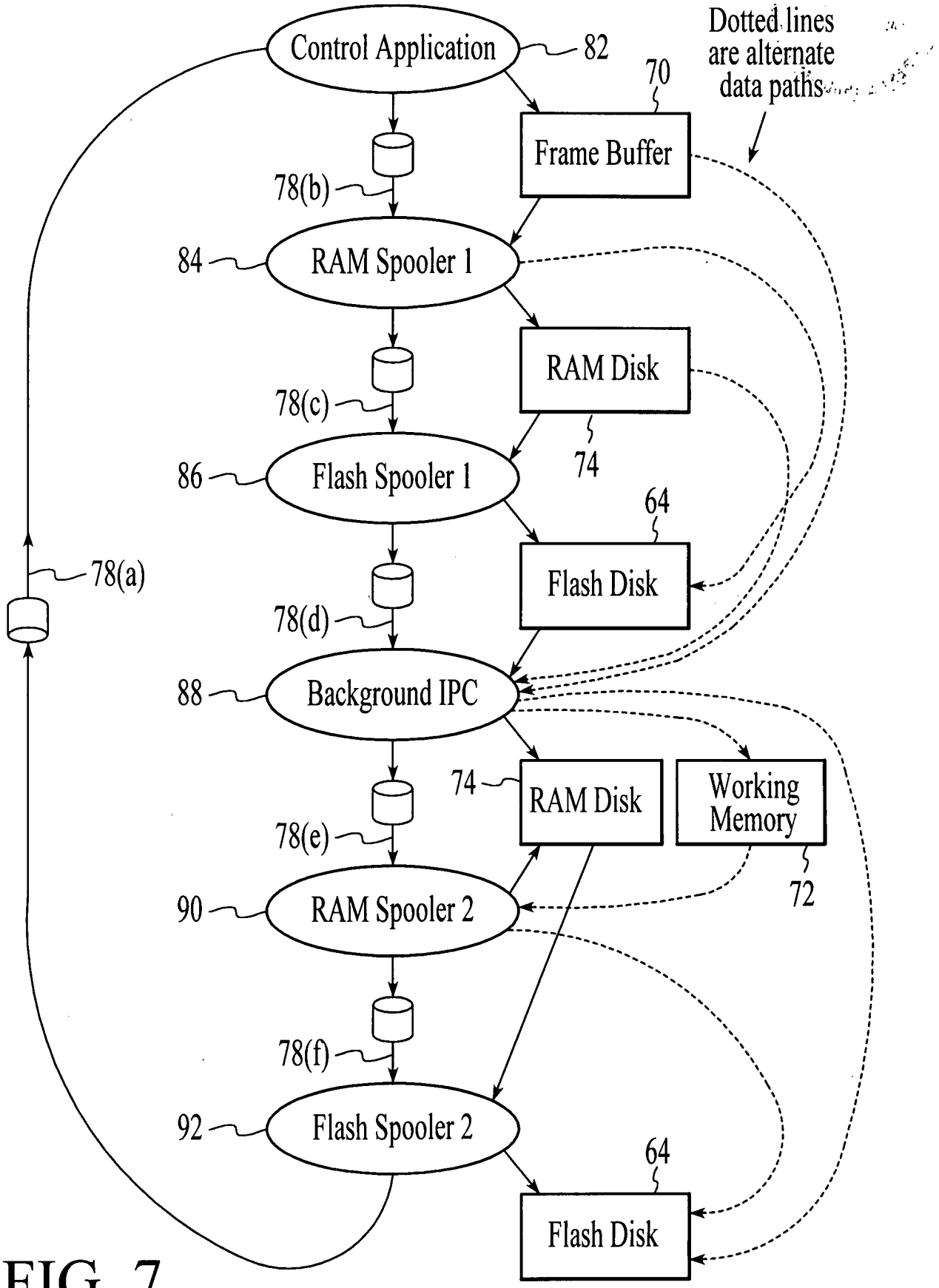
Control Application
82
Dotted lines are alternate data paths
70
Frame Buffer
78(b)
84
RAM Spooler 1
RAM Disk
78(c)
74
86
Flash Spooler 1
64
Flash Disk
78(a)
78(d)
88
Background IPC
74
RAM Disk
Working Memory
78(e)
72
90
RAM Spooler 2
78(f)
92
Flash Spooler 2
64
Flash Disk

FIG. 7

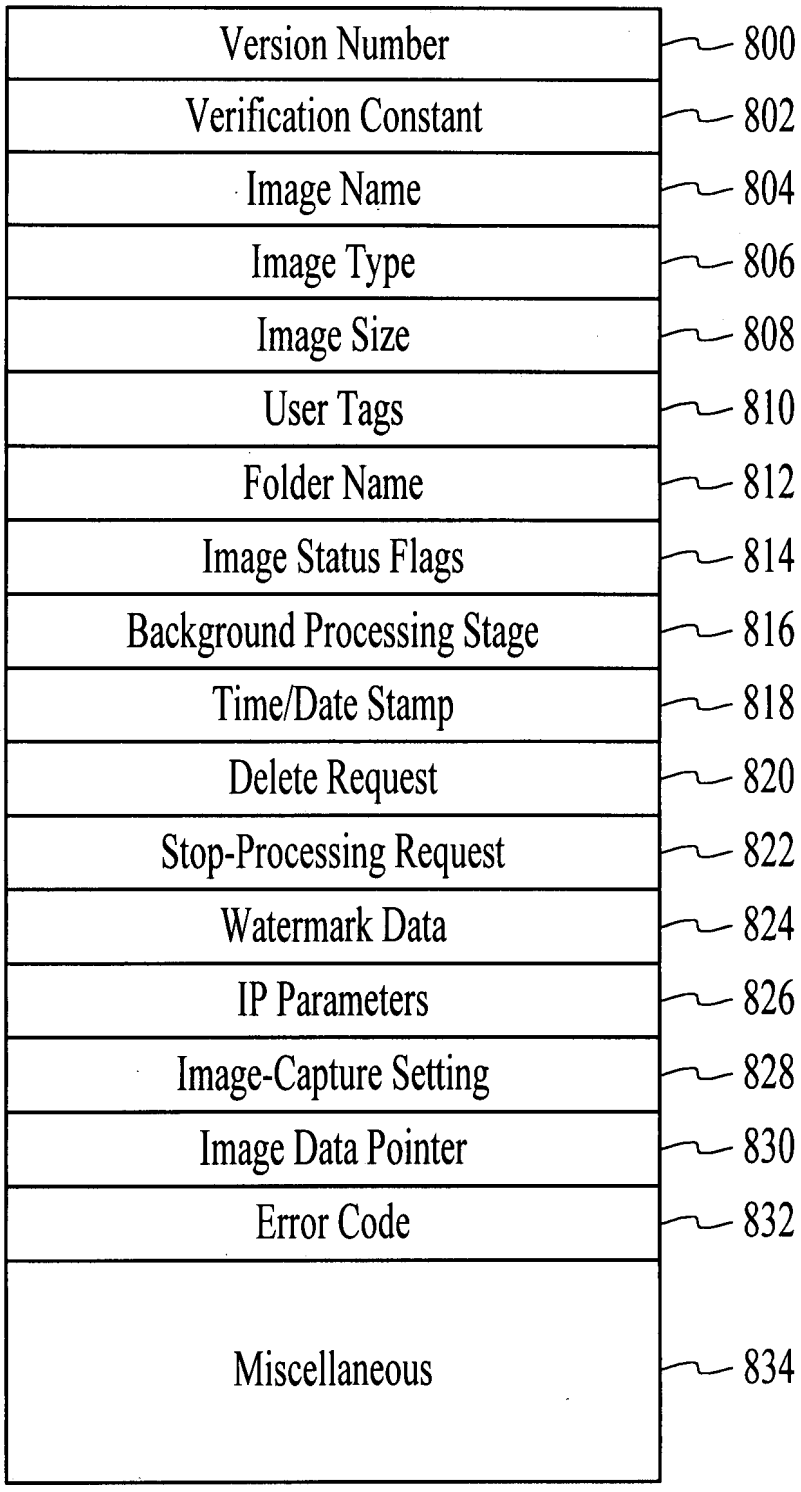
Version Number
800
Verification Constant
802
Image Name
804
Image Type
806
Image Size
808
User Tags
810
Folder Name
812
Image Status Flags
814
Background Processing Stage
816
Time/Date Stamp
818
Delete Request
820
Stop-Processing Request
822
Watermark Data
824
IP Parameters
826
Image-Capture Setting
828
Image Data Pointer
830
Error Code
832
Miscellaneous
834
76
Data Cell

FIG. 8

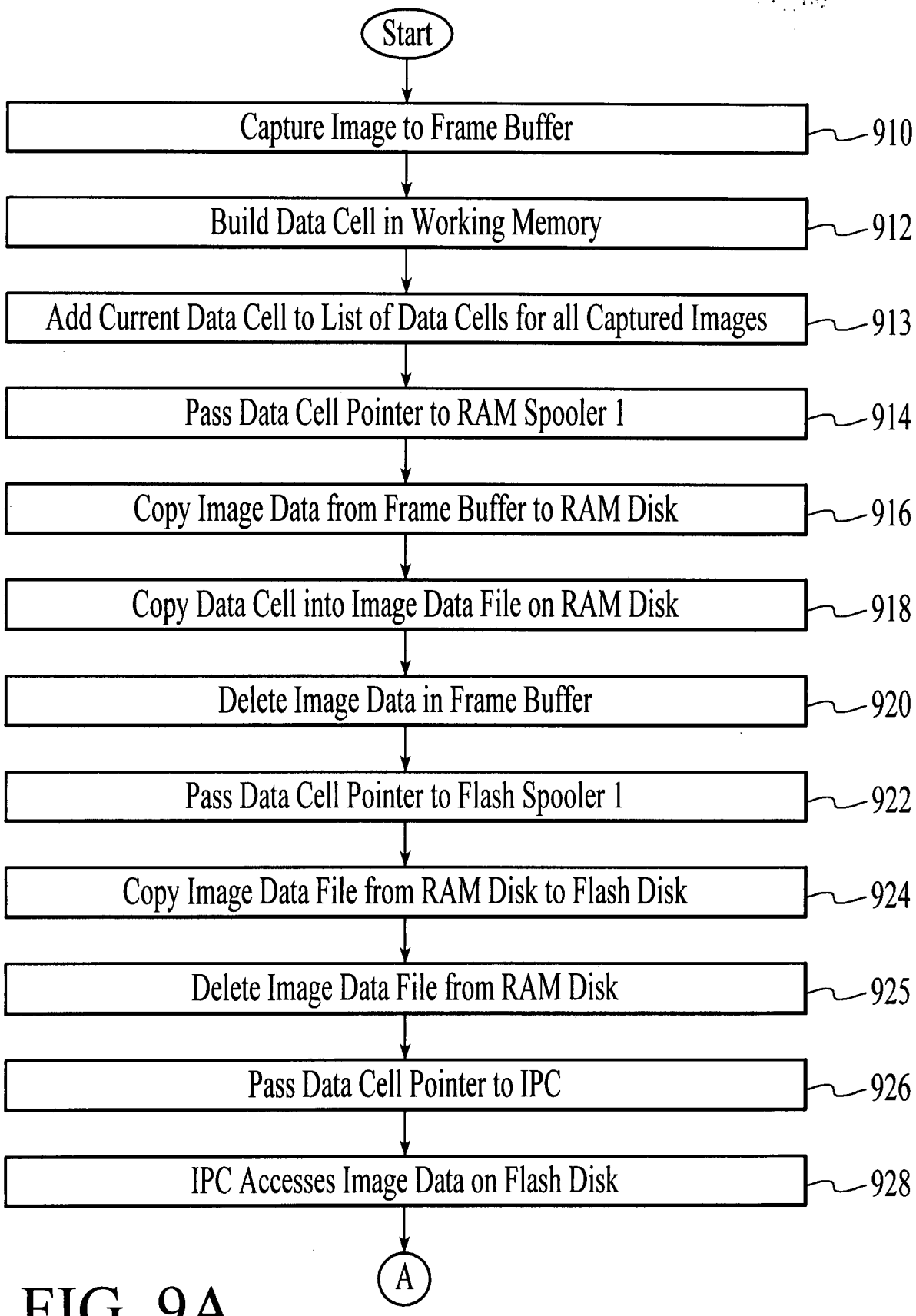
Start
Capture Image to Frame Buffer
910
Build Data Cell in Working Memory
912
Add Current Data Cell to List of Data Cells for all Captured Images
913
Pass Data Cell Pointer to RAM Spooler 1
914
Copy Image Data from Frame Buffer to RAM Disk
916
Copy Data Cell into Image Data File on RAM Disk
918
Delete Image Data in Frame Buffer
920
Pass Data Cell Pointer to Flash Spooler 1
922
Copy Image Data File from RAM Disk to Flash Disk
924
Delete Image Data File from RAM Disk
925
Pass Data Cell Pointer to IPC
926
IPC Accesses Image Data on Flash Disk
928
A

FIG. 9A

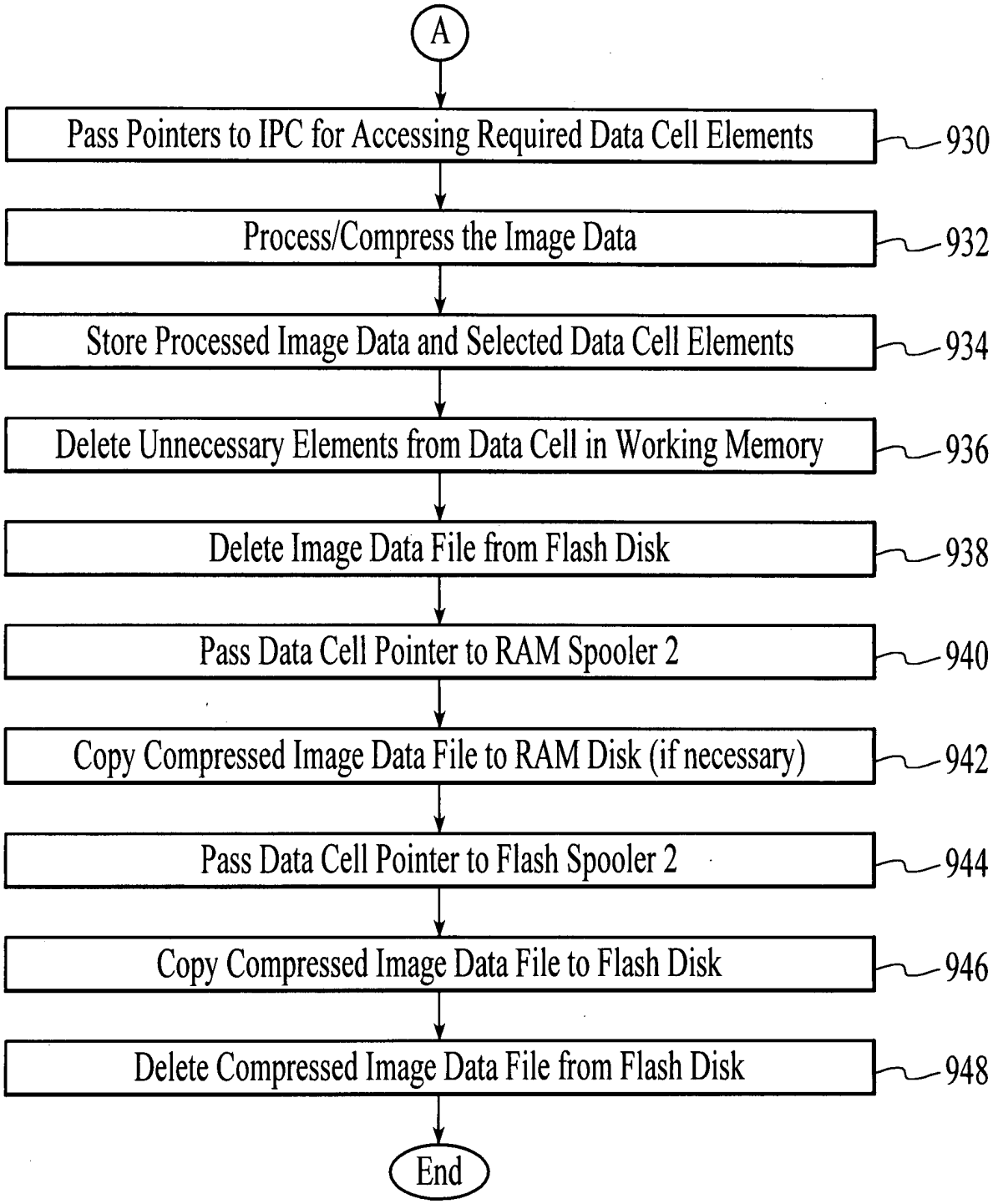
A
Pass Pointers to IPC for Accessing Required Data Cell Elements
930
Process/Compress the Image Data
932
Store Processed Image Data and Selected Data Cell Elements
934
Delete Unnecessary Elements from Data Cell in Working Memory
936
Delete Image Data File from Flash Disk
938
Pass Data Cell Pointer to RAM Spooler 2
940
Copy Compressed Image Data File to RAM Disk (if necessary)
942
Pass Data Cell Pointer to Flash Spooler 2
944
Copy Compressed Image Data File to Flash Disk
946
Delete Compressed Image Data File from Flash Disk
948
End

FIG. 9B

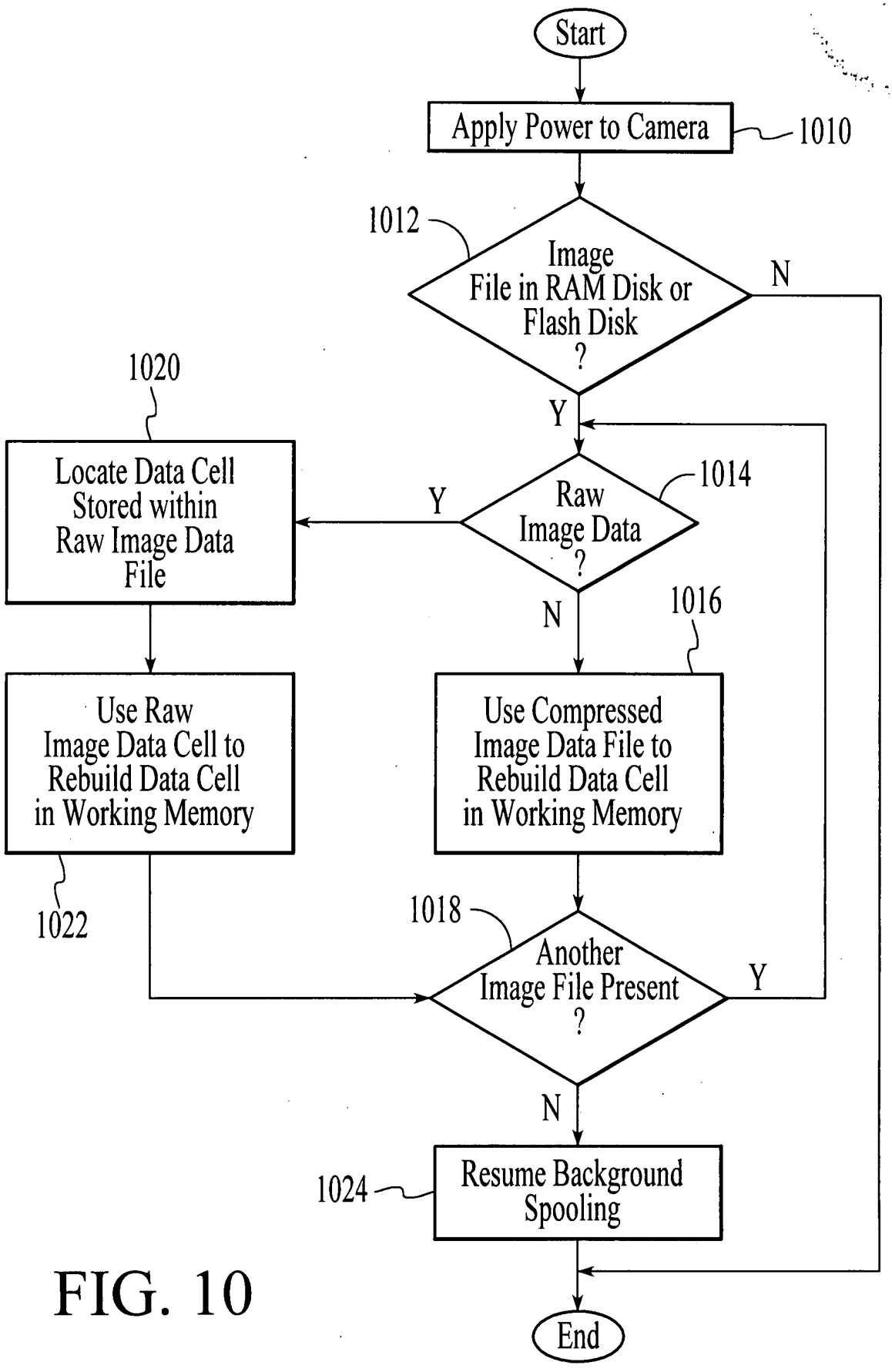
Start
Apply Power to Camera
1010
1012
Image File in RAM Disk or Flash Disk ?
N
Y
1020
Locate Data Cell Stored within Raw Image Data File
Y
Raw Image Data ?
1014
N
1016
Use Raw Image Data Cell to Rebuild Data Cell in Working Memory
Use Compressed Image Data File to Rebuild Data Cell in Working Memory
1022
1018
Another Image File Present ?
Y
N
1024
Resume Background Spooling
End

FIG. 10